Report Information from Dialog DataStar

Table of Contents

Motion segmentation and estimation of active skeletal muscles in ultrasonic image sequences.

Accession number & update
0006513307 20070101.

Conference information
Proceedings of the First Joint BMES/EMBS Conference, Atlanta, GA, USA, 13–16 Oct. 1999.
Sponsor(s): Medtronic; Johnson & Johnson; Baxter Cardio Vascular Group; Becton Dickinson & Co; Georgia Biomed. Partnership; Guidant Found; Kilpatrick Stockton LLP; King & Spaulding; Troutman Sanders LLP; Adv. Tissue Sci; AVL Biosense Corp; CUH2A; Ernst & Young LLP; State of Georgia; Dept. Ind; Trade & Tourism; Healthdyne Companies; Long Aldrige & Norman; Porex Corp; Sulzer Innotec; Turner Constr. Company.

Source
Proceedings of the First Joint BMES/EMBS Conference. 1999 IEEE Engineering in Medicine and Biology 21st Annual Conference and the 1999 Annual Fall Meeting of the Biomedical Engineering Society (Cat. No.99CH37015), 1999, vol.2, p. 1064 vol.2, 2 refs, pp. 2 vol. vi+1345, ISBN: 0–7803–5674–8. Publisher: IEEE, Piscataway, NJ, USA.

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Tzu–Lun Weng, Yung–Nien Sun, Dept. of Comput. Sci. & Inf. Eng., Nat. Cheng Kung Univ., Tainan, Taiwan.

Abstract
The **segmentation** of high contrast anatomical structure from different medical images has been widely explored. However there are seldom algorithms available to reliably segment soft tissue structures of a moving musculoskeletal system with ambiguous boundaries from ultrasound image sequences. Often, ambiguous object boundaries in a single image frame can be easily resolved when dynamic effects are computed based on a sequence of frames. However, the contraction of active skeletal muscles is very complex, such as concentric contraction, isometric contraction and eccentric contraction. These inhomogeneous **motion** properties make them very difficult to segment. In this paper, we proposed a new algorithm to segment the active skeletal muscles by **minimizing** an **energy** function and the curve **motion** estimation.

Descriptors
BIOMEDICAL–ULTRASONICS; **IMAGE–**SEGMENTATION; IMAGE–SEQUENCES; MEDICAL–IMAGE–PROCESSING; **MOTION–**ESTIMATION; MUSCLE.

Classification codes
A8760B Sonic–and–ultrasonic–radiation–medical–uses*;
A8770E Patient–diagnostic–methods–and–instrumentation;
A8745B Mechanical–properties–of–tissues–and–organs;
B7510H Sonic–and–ultrasonic–radiation–biomedical–imaging–measurement*;
B7820 Sonic–and–ultrasonic–applications;
B6135E Image–recognition;
C7330 Biology–and–medical–computing*;
C5260B Computer–vision–and–image–processing–techniques.

Keywords
US–image–sequences; active–skeletal–muscles; **motion–**segmentation; **motion–**estimation; high–contrast–anatomical–structure; soft–tissue–structures; moving–musculoskeletal–system; ambiguous–boundaries; concentric–contraction; isometric–contraction; eccentric–contraction; **inhomogeneous–**motion–properties; **energy–**function–minimization; deformable–model; block–matching; cross–correlation; least–squares;

smooth–constraints.

Treatment codes
X Experimental.

Language
English.

Publication type
Conference–paper.

Availability
CCCC: 0 7803 5674 8/99/$10.00.

Digital object identifier
10.1109/IEMBS.1999.804222.

Publication year
1999.

Publication date
19990000.

Edition
2000008.

Copyright statement
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Geodesic deformable models for medical image analysis.

Dialog eLinks
Full text options USPTO Full Text Retrieval Options

Accession number & update
0006105707 20070101.

Source
IEEE Transactions on Medical Imaging, {IEEE–Trans–Med–Imaging–USA}, Aug. 1998, vol. 17, no. 4, p. 634–41, 28 refs, CODEN: ITMID4, ISSN: 0278–0062. Publisher: IEEE, USA.

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Abstract
In this paper implicit representations of deformable models for medical image enhancement and **segmentation** are considered. The advantage of implicit models over classical explicit models is that their topology can be naturally adapted to objects in the scene. A geodesic formulation of implicit deformable models is especially attractive since it has the **energy minimizing** properties of classical models. The aim of this paper is twofold. First, a modification to the customary geodesic deformable model approach is introduced by considering all the level sets in the image as **energy minimizing** contours. This approach is used to segment multiple objects simultaneously and for enhancing and segmenting cardiac computed tomography (CT) and magnetic resonance images. Second, the approach is used to effectively compare implicit and explicit models for specific tasks. This shows the complementary character of implicit models since in case of poor contrast boundaries or gaps in boundaries, e.g. due to partial volume effects, noise, or **motion** artifacts, they do not perform well, since the approach is completely data–driven.

Descriptors
BIOMEDICAL–MRI; CARDIOLOGY; COMPUTERISED–TOMOGRAPHY; IMAGE–ENHANCEMENT; **IMAGE–**SEGMENTATION; MEDICAL–IMAGE–PROCESSING; MODELLING.

Classification codes
A8710 General–theoretical–and–mathematical–biophysics*;
A8770E Patient–diagnostic–methods–and–instrumentation;
A8760I Medical–magnetic–resonance–imaging–and–spectroscopy;

A8760J X–rays–and–particle–beams–medical–uses;
B7510P X–ray–techniques–radiography–and–computed–tomography–biomedical–imaging–measurement*;
B7510N Biomedical–magnetic–resonance–imaging–and–spectroscopy;
B6135 Optical–image–and–video–signal–processing;
C7330 Biology–and–medical–computing*;
C5260B Computer–vision–and–image–processing–techniques.

Keywords

geodesic–deformable–models; medical–image–analysis; implicit–representations; classical–explicit–models; topology–adaptation; **energy–**minimizing–properties; **energy–**minimizing–contours; cardiac–computed–tomography; magnetic–resonance–images; medical–diagnostic–imaging; contrast–boundaries; boundary–gaps; data–driven–approach; partial–volume–effects; noise; **motion–**artifacts.

Treatment codes

T Theoretical–or–mathematical.

Language

English.

Publication type

Journal–paper.

Availability

SICI: 0278–0062(199808)17:4L.634:GDMM; 1–L.
CCCC: 0278–0062/98/$10.00.
Publisher identity number: S0278–0062(98)08577–2.

Digital object identifier

10.1109/42.730407.

Publication year

1998.

Publication date

19980800.

Edition

1998049.

Copyright statement

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Minimal surfaces based object segmentation.

Dialog eLinks

Full text options USPTO Full Text Retrieval Options

Accession number & update

0005606024 20070101.

Source

IEEE Transactions on Pattern Analysis and Machine Intelligence, {IEEE–Trans–Pattern–Anal–Mach–Intell–USA}, April 1997, vol. 19, no. 4, p. 394–8, 36 refs, CODEN: ITPIDJ, ISSN: 0162–8828. Publisher: IEEE Comput. Soc, USA.

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Abstract

A geometric approach for 3D object **segmentation** and representation is presented. The **segmentation** is obtained by deformable surfaces moving towards the objects to be detected in the 3D image. The model is based on curvature **motion** and the computation of surfaces with minimal areas, better known

as minimal surfaces. The space where the surfaces are computed is induced from the 3D image (volumetric data) in which the objects are to be detected. The model links between classical deformable surfaces obtained via **energy minimization,** and intrinsic ones derived from curvature based flows. The new approach is stable, robust, and automatically handles changes in the surface topology during the deformation.

Descriptors

GEOMETRY; **IMAGE–**SEGMENTATION; MINIMISATION; OBJECT–DETECTION.

Classification codes

B6140C Optical–information–image–and–video–signal–processing*;
B0260 Optimisation–techniques;
B0250 Combinatorial–mathematics;
C1250 Pattern–recognition*;
C1180 Optimisation–techniques;
C1160 Combinatorial–mathematics.

Keywords

minimal–surfaces–based–object–segmentation; geometric–approach; 3D–**object–**segmentation; object–representation; deformable–surfaces; **curvature–**motion; surface–computation; 3D–image; volumetric–data; classical–deformable–surfaces; **energy–**minimization; curvature–based–flows.

Treatment codes

T Theoretical–or–mathematical.

Language

English.

Publication type

Journal–paper.

Availability

SICI: 0162–8828(199704)19:4L.394:MSBO; 1–V.
CCCC: 0162–8828/97/$10.00.

Digital object identifier

10.1109/34.588023.

Publication year

1997.

Publication date

19970400.

Edition

1997024.

Copyright statement

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Object based 3–D motion and structure estimation.

Accession number & update

0005241869 20070101.

Conference information

Proceedings International Conference on Image Processing, Washington, DC, USA, 23–26 Oct. 1995.
Sponsor(s): IEEE Signal Process. Soc.

Source

Proceedings. International Conference on Image Processing (Cat. No.95CB35819), 1995, vol.1, p. 390–3 vol.1, 6 refs, pp. 3 vol. (xliii +664+666+672), ISBN: 0–7803–3122–2. Publisher: IEEE Comput. Soc. Press, Los Alamitos, CA, USA.

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Abstract

Motion analysis is the most crucial part of object–based coding. **Motion** in a 3–D environment can be analyzed better by using a 3–D **motion** model compared to its 2–D counterpart and hence may improve coding efficiency. Gibbs formulated joint **segmentation** and estimation of 2–D **motion** not only improves the performance, but also generates robust point correspondences which are necessary for linear 3–D **motion** estimation algorithms. Estimated 3–D **motion** parameters are used to find the structure of the previously segmented objects by **minimizing** another Gibbs **energy.** Such an approach achieves error immunity compared to linear algorithms. Experimental results are promising and hence the proposed **motion** and structure analysis method is a candidate to be used in object–based (or even knowledge–based) video coding schemes.

Descriptors

BAYES–METHODS; **IMAGE–**SEGMENTATION; **MOTION–**ESTIMATION; PARAMETER–ESTIMATION; VIDEO–CODING.

Classification codes

B6140C Optical–information–image–and–video–signal–processing*;
B6120B Codes;
B0240Z Other–topics–in–statistics.

Keywords

3D–structure–estimation; **3D–**motion–estimation; **motion–**analysis; object–based–coding; coding–efficiency; **2D–**motion–segmentation; performance; robust–point–correspondences; **linear–**3D–motion–estimation–algorithms; **3D–**motion–parameters; parameter–estimation; **Gibbs–**energy; error–immunity; experimental–results; structure–analysis–method; knowledge–based–video–coding; object–based–video–coding; Bayesian–approach.

Treatment codes

T Theoretical–or–mathematical;
X Experimental.

Language

English.

Publication type

Conference–paper.

Availability

CCCC: 0 8186 7310 9/95/$4.00.

Digital object identifier

10.1109/ICIP.1995.529728.

Publication year

1995.

Publication date

19950000.

Edition

1996015.

Search Strategy

No.	Database	Search term	Info added since	Results
1	INZZ	segmentation AND energy SAME minimiz$5	unrestricted	641
2	INZZ	1 AND motion	unrestricted	113

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